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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/665,910	09/18/2003	Kazue Kudo	16869G-087100US	7077

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TOWNSEND AND TOWNSEND AND CREW, LLP
TWO EMBARCADERO CENTER
EIGHTH FLOOR
SAN FRANCISCO, CA 94111-3834

EXAMINER	
BERNATZ, KEVIN M	

ART UNIT	PAPER NUMBER
1773	

DATE MAILED: 12/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/665,910	KUDO ET AL.	
	Examiner	Art Unit	
	Kevin M. Bernatz	1773	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *8-10 and 12-17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *8-10 and 12-17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. Preliminary amendments to claim 8 and addition of claims 12 - 17, filed on November 23, 2005, have been entered in the above-identified application.

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Request for Continued Examination

3. The Request for Continued Examination (RCE) under 37 CFR 1.53 (d) filed on September 27, 2005 is acceptable and a RCE has been established. An action on the RCE follows.

Examiner's Comments

4. While the Examiner notes that applicants do not have literal support for the subject matter of claims 14 and 16 (since the specification merely discloses using a 46NiFe or 80NiFe alloy film – *Paragraphs 0025 – 0030*), the Examiner notes that one of ordinary skill in the art would readily appreciate that the term "NiFe" used in the context of the disclosed and claimed invention would be an alloy comprising more than 2 wt% Ni, hence supporting the limitation "which has a higher Ni percentage than said first part" even though the specification does not positively recite such language. For conciseness, the Examiner recommends that applicants amend the specification to

positively recite the language "contains NiFe which has a higher Ni percentage than said first part".

Claim Objections

5. Claim 16 objected to because of the following informalities: "first magnet layer" in line 3 should be "first magnetic layer". Appropriate correction is required.

Claim Rejections - 35 USC § 103

6. Claims 8 – 10 and 15 –17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shouji et al. (U.S. Patent No. 6,033,580) in view of Chen et al. (U.S. Patent No. 6,776,891 B2).

Regarding claim 8, Shouji et al. disclose a method for producing a thin-film magnetic head, comprising forming a magnetic core having magnetic layers (*Figure 25, elements 17 – 19, 30, 31 and 41*) and forming a magnetic gap film (*element 13 at the active sensor region facing the recording medium, element MD*) facing said magnetic core, wherein a magnetic layer, of said magnetic layers, contains Co, Ni and Fe and is a high saturation magnetic layer (*elements 30 and 31 and col. 6, lines 32 - 65*) and wherein said magnetic layer is the nearest layer to said magnetic gap of said magnetic layers (*Figure 25 and col. 6, lines 32 – 65*).

Shouji et al. fail to disclose using a plated CoNiFe layer meeting applicants' claimed composition or saturation magnetization value formed by electroplating in a plating bath having a pH value of 2 or less, though Shouji et al. does teach that the

elements 30 and 31 should be formed of materials having high saturation magnetization (Bs = 4πMs).

However, Chen et al. teach a plated CoNiFe film, formed by electroplating in a plating bath having a pH value of 2 or less, meeting applicants' claimed composition and saturation magnetic flux density limitations (*col. 3, lines 52 – 57; col. 4, lines 29 – 49; col. 6, lines 36 – 53; and Table 2*). Chen et al. further teach that such a film is excellent for use in magnetic head applications since it possesses high saturation magnetic flux density and low coercive force and can be readily formed by electroplating (*col. 1, line 7 bridging col. 3, line 9*).

It would therefore have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the device of Shouji et al. to use the disclosed CoNiFe film of Chen et al. as the plated layer nearest the magnetic gap (i.e. as the high saturation film elements 30 and 31), thereby meeting applicants' claimed limitations, as taught by Chen et al. since such a film is excellent for use in magnetic head applications since it possesses high saturation magnetic flux density and low coercive force and can be readily formed by electroplating.

Regarding claims 9 and 10, Shouji et al. disclose upper and lower magnetic cores meeting applicants' claimed limitations (*Figure 25, as described above*).

Regarding claim 15, Shouji et al. and Chen et al. are relied upon as described above. Shouji et al. further disclose a method for producing a thin-film magnetic head, comprising forming a read element (*Figure 25, element 40*), forming a first magnetic layer (*element 31*) above said read element, forming a magnetic gap film (*element 13*)

above said first magnetic layer, forming a coil (*element 21*) and insulating layer (*element 20*) above said first magnetic layer, forming a second magnetic layer (*elements 17 – 19 and 30*) above said magnetic gap, wherein at least a first part of said first magnetic layer contains the high saturation magnetic flux density film (*element 31*) as disclosed in the Chen et al. reference.

Regarding claim 16, Shouji et al. disclose a second part of said first magnetic layer (*element 41*) containing NiFe which has a higher Ni percentage than the first part (*col. 6, lines 31 – 65 and col. 7, lines 36 – 54: where element 41 is taught to be the lower pole and the lower pole is taught to be formed of 81-permalloy (81 Ni, 19 Fe)*). The first part (*element 31*) is closer to the magnetic gap (*element 13 at the active sensor region facing the recording medium, element MD*) than said second part (*element 41*). The Examiner further notes that when viewed along the "face" of the magnetic head facing the recording medium (as in applicants' Figure 1D), the pole tip (element 31) is clearly closer to the magnetic gap than the core layer (element 41).

The Examiner further notes that Shouji et al. does not explicitly disclose plating the second part of the first magnetic layer (*though the Examiner notes that Shouji et al. does explicitly refer to sputtering, thereby implicitly implying that the other layers are not sputtered, and hence plated*). However, Chen et al. provides explicit teaching that electroplating is a useful method of depositing magnetic films used in magnetic heads (*col. 2, lines 39 – 63*) and it would have been obvious to electroplate the NiFe film since electroplating is a known method and can be used to readily form relatively thick layers of magnetic material possessing good soft magnetic properties.

Regarding claim 17, Shouji et al. disclose forming a NiFe layer (*element 42 and col. 7, lines 36 - 54*) under said first magnetic layer.

7. Claims 12 – 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shouji et al. in view of Chen et al. as applied above, and further in view of Hashimoto et al. (U.S. Patent App. No. 2003/0188422 A1).

Shouji et al. and Chen et al. are relied upon as described above.

Regarding claims 12 and 13, Shouji et al. further disclose forming a read element, a first magnetic layer, a magnetic gap film and a coil and insulating layer as described above. Shouji et al. further disclose a second magnetic layer (*element 30*) above said magnetic gap, wherein at least a first part of said second magnetic layer contains the high saturation magnetic flux density film (*element 30*) as disclosed in the Chen et al. reference.

Neither of the above disclose an underlayer meeting applicants' process and structural limitations.

However, Hashimoto et al. teach that it is known in the art to sputter form underlayers meeting applicants' claimed structural limitations inorder to serve as the lower electrode for plating the upper pole pieces in a magnetic head (*Paragraphs 0089 – 0090*).

It would, therefore, have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the device of Shouji et al. in view of Chen et al. to use an underlayer meeting applicants' claimed process and structural limitations

as taught by Hashimoto et al. since such an underlayer can serve as the lower electrode for plating the upper pole pieces in a magnetic head.

Regarding claim 14, Shouji et al. disclose a second part of said second magnetic layer (*elements 17 - 19*) containing NiFe which has a higher Ni percentage than the first part (*col. 6, lines 31 – 65 and col. 7, lines 36 – 54: where elements 17 – 19 are taught to be the upper pole and the upper pole is taught to be formed of 81-permalloy (81 Ni, 19 Fe)*). The first part (*element 30*) is closer to the magnetic gap (*element 13 at the active sensor region facing the recording medium, element MD*) than said second part (*elements 17 - 19*).

The Examiner further notes that Shouji et al. does not explicitly disclose plating the second part of the second magnetic layer (*though the Examiner notes that Shouji et al. does explicitly refer to sputtering, thereby implicitly implying that the other layers are not sputtered, and hence plated*). However, Chen et al. provides explicit teaching that electroplating is a useful method of depositing magnetic films used in magnetic heads (*col. 2, lines 39 – 63*) and it would have been obvious to electroplate the NiFe film since electroplating is a known method and can be used to readily form relatively thick layers of magnetic material possessing good soft magnetic properties.

Response to Arguments

8. The rejection of claims 8 - 10 under 35 U.S.C § 103(a) – Ohashi et al. in view of Chen et al.

Applicant's arguments have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin M. Bernatz whose telephone number is (571) 272-1505. The examiner can normally be reached on M-F, 9:00 AM - 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carol Chaney can be reached on (571) 272-1284. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

KMB
December 3, 2005

Kevin M. Bernatz, PhD
Primary Examiner